

Estimating the Need for Facilities for Renal Dialysis

LESLIE LIPWORTH, M.B., B.Ch., B.Sc.

INFORMATION concerning the annual incidence of end-stage uremia in patients who are suitable for renal dialysis is a basic requirement for planning facilities for such treatment. A recent report by the Committee on Chronic Kidney Disease (1a) contains the statement that patients with chronic uremia die within a relatively short time, and therefore data from death certificates may be the only usable source of such information.

The purpose of this study was to estimate the number of patients in the United States who could benefit from long term dialysis by using mortality data from the Inter-American Investigation of Mortality (2a). The collaborative study sponsored by the Pan American Health Organization entailed collecting detailed information for 1962-64 from several large cities in North and South America and in England which would serve primarily as a basis for international comparisons of causes of death.

Method

This paper was based on deaths of San Francisco residents reported to the Inter-American Investigation of Mortality between October 1, 1962, and September 30, 1964 (2b). At the time of the Inter-American Investigation of Mortality, the population of San Francisco aged 15-64 years was 481,000.

The figure required adjustment for two factors. The first factor was that only every third

death was accepted in the study sample, and the second was the 2-year duration of the study. Therefore, the effective population at risk used for calculating the annual incidence of patients requiring dialysis is two-thirds of 481,000 or 320,700 (2c), for the age range 15-64 years.

The sample covered deaths of 1,451 males and 783 females aged 15-64 years and was an effectively random sample of one in three deaths of San Francisco residents in this period, irrespective of the locality where the deaths occurred. Of the total 2,234 decedents, autopsies were performed on 68 percent.

The method adopted by the Inter-American Investigation of Mortality was to followup each death reported to the study with a visit to the deceased's relatives or friends. Questions were asked about the deceased's occupation, medical history, and habits as well as dates and places

Dr. Lipworth is medical director of the statistical unit, bureau of chronic disease control, Massachusetts Department of Public Health.

Data for San Francisco were accumulated under the direction of Dr. Ellis Sox, city commissioner of public health. Dr. Ruth R. Puffer and Dr. G. Wynne Griffith of the Pan American Sanitary Bureau advised and helped in setting up the study, and Dr. Charles Myers of the Lemuel Shattuck Hospital dialysis unit advised on clinical aspects of the investigation.

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where the deceased might have received medical attention. If a friend or relative were not available, the physician who signed the death certificate served as the starting point in the inquiry which eventually covered hospital records and autopsy reports.

Information concerning each death of persons aged 15-64 in the San Francisco data was examined for evidence of renal involvement. When such evidence was found, the case notes were set aside to be scrutinized again. The case notes were then re-examined to ascertain which patients had had chronic uremia, and a decision was made regarding their suitability for long term dialysis.

Although broad criteria covering this decision had been laid down, they were no more than very rough guidelines. Therefore all doubtful cases were discussed with a nephrologist of the renal dialysis unit of the Lemuel Shattuck Hospital in Boston, Mass. The criteria followed in this study are also those of the Lemuel Shattuck Hospital dialysis unit.

Age. The patient should have reached physical maturity and preferably should be 18-50 years old. In this study 15 and 64 years were taken as the lower and upper limits.

Disqualifying pathological processes. Conditions which would have contraindicated long term dialysis were diffuse vascular disease, irreversible heart disease, previous cerebral vascular accidents, vascular evidence of severe hypertension, malignant disease, severe neuropathy, diabetes mellitus, severe generalized disease such as lupus, bleeding which was not uremic, history of reactions to transfusions, and irreversible impairment of sight.

Behavioral factors. Any psychological or social condition in the patient or his immediate family group which would have prevented him from following the rigorous dietary regimen and other exacting demands of long term dialysis would have been reason for disqualification.

Except for one 59-year-old patient with renal failure who had other complications which were also taken into consideration to disqualify him, age was not considered a disqualifying factor within the age range used in this study.

It was clear from the data that subsequent

to each death, efforts had been made to discover whether the decedents had been alcoholic and whether those with diabetes had followed medical advice. Nonetheless, it is hardly possible to assess retrospectively from data accumulated after death the psychological suitability of patients for an existence dependent on dialysis or even their willingness to undergo such treatment.

Therefore, the investigation was directed to estimating the annual incidence of patients who would appear to be physically suitable for dialysis. When it was apparent that the decedent had been alcoholic or displayed other disadvantageous traits, these factors were considered in the results.

Whether patients would be referred for dialysis at an advantageous point in their illness depends to a large extent on the physician's awareness of the danger of delaying such treatment. As dialysis becomes more generally available, probably the timing of the commencement of such treatment will be improved.

Results

Of the 16 patients who may have been suitable for renal dialysis from the standpoint of their physical condition (see table), two would have been disqualified because of histories of alcoholism and one would not have been accepted because he was mentally retarded. Thus 13 patients would have been considered both mentally and physically suitable for long term dialysis.

According to their case histories, the two oldest decedents, aged 59 and 61, did not have widespread arteriosclerosis, and they are included among those thought suitable for dialysis. In view of their more advanced ages, however, such patients usually would not have been accepted on the program without a thorough search for evidence of degenerative arterial disease. The proportion of patients who would have been selected for dialysis and who were 55 years of age or older is small, considering that 55 percent of all deaths in the age range 15-64 years in the sample were of persons over 55 years old.

If the 13 patients found suitable for dialysis in the study are related to the effective population at risk of 320,700 aged 15-64 years, this figure would then correspond to 41 per million

Patients considered physically suitable for long term dialysis¹

Presumed cause of renal failure	Total	Males	Females	15-44 years	45-54 years	55-64 years
All causes.....	16	13	3	11	2	² 3
Chronic glomerulonephritis.....	7	7	0	6	0	1
Nephrosclerosis.....	4	4	0	2	2	0
Chronic pyelonephritis.....	2	0	2	2	0	0
Renal tubercle.....	1	0	1	0	0	1
Polycystic kidney.....	1	1	0	0	0	1
Renal cortical necrosis.....	1	1	0	1	0	0

¹ Based on a random sample of 2,234 deaths of San Francisco residents, 1962-64.

² Patients' ages were 56, 59, and 61 years.

persons in this age range. Application of the Poisson distribution to the incidence of 13 cases indicates, however, that the lower and upper 95 percent confidence limits would be 18 and 63 per million, respectively.

Discussion

Other estimates of the annual number of new patients requiring continual hemodialysis have been made in the United States. Physicians in a defined area in Seattle (3) were sent questionnaires designed to ascertain the number of patients with renal failure who might benefit from dialysis. Patients over 45 years of age or young adults who were not self-supporting were excluded. An annual incidence figure of 5-20 cases per million population was derived from the information obtained.

In the report of the Committee on Chronic Kidney Disease (1b), the figure of 6,400 new patients requiring long term renal dialysis in the United States, or 33 per million population, was given for 1964. The figure was based on national mortality statistics for certain renal and hypertensive diseases and was adjusted by the results of a survey of nephrologists who were asked to estimate the proportion suitable for dialysis.

Difficulties encountered in this approach to estimating the number of patients requiring long term dialysis include the absence of clear-cut criteria governing the selection of patients and the fact that data collected in one area, in this case San Francisco, may not be applicable to another. Again, large numbers of deaths would have to be analyzed to reduce the random variation of the final estimate to a workable di-

mension. Probably 20,000 deaths for all ages would provide that each confidence limit differed from the estimate by roughly one quarter of the estimate.

Such research, perhaps, would be worthwhile only if, as in the investigation of the Pan American Health Organization, the data were collected for other essential public health information. Alternatively, the findings could be considered with those of other investigations into the same problem, such as a followup of a sample of death certificates stratified according to diseases mentioned with a simple questionnaire to the physician. For example, no questionnaire would be sent if death were certified as due to cancer.

The estimate from this study of an annual incidence of 41 per million persons aged 15-64 years who could benefit from long term renal dialysis corresponds to 26 per million for all ages. This can be compared with the figure of 33 per million in the report of the Committee on Chronic Kidney Disease.

Conclusion

The experience of most dialysis units indicates that cases would accumulate because many patients can be maintained in reasonably good health for several years. The results of this study, even at the lower 95 percent confidence limit, indicate that an annual additional 18 new patients per million population aged 15-64 could benefit from long term dialysis. Assuming an average survival of 5 years, there would eventually be a prevalence of 90 patients per million population, or more than 10,000 persons

in the United States, who could benefit from long term dialysis provided treatment were extended to all persons with chronic renal disease.

REFERENCES

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Policy Statement on Courteous Treatment

Dr. Philip R. Lee, Assistant Secretary for Health and Scientific Affairs, Department of Health, Education, and Welfare, has issued the following policy statement on courteous treatment of all those receiving medical care.

Individual health care is, by its very nature, the most personal of services. Those who seek it often do so in fear, anxiety, and confusion. They are usually as sensitive to the fashion in which service is given as to the service itself.

We are deeply concerned, for these reasons, that the highest level of consideration for human dignity be reflected in the manner in which health services are delivered to any individual.

During the meeting on April 30, 1968, with delegates from the Poor People's Campaign, prominent among their grievances was that of insufficient respect shown toward those receiving personal health care. None but the most insensitive among us—from the administrator to those who actually dispense care—can fail to be disturbed by this recurrent theme, so antithetical to the traditions all of us seek to maintain.

It is in this connection that we want to convey to every State, local, or other agency which administers personal health

care programs our own strong feelings about this.

In order to emphasize the need for courteous treatment of all those receiving medical care and how we can best assure this treatment, I am requesting that this memorandum be sent to every health care institution or agency participating in health care programs supported by the Public Health Service to require that patients receive only the utmost courtesy in getting health care, including the appropriate use of courtesy titles (Mr., Mrs., and Miss) in both written and oral communications with adult patients.

I would also ask that every health care institution, agency or individual participating in health care programs supported by the Public Health Service evaluate the fashion in which care is rendered to assure that only the highest standards of respect for patients are followed.

Finally, in every administrative procedure, research investigation, public health clinic, or any other setting in which there is personal contact, this Department, conducting or supporting such activities, will continue to expect that each contact shall be undertaken and conducted with full consideration for all courtesies and civilities essential to the dignity and self-esteem of every individual.